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THE STATUS QUO IN DISCRETE CHOICE EXPERIMENTS: IS IT RELEVANT?

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An issue in environmental economics is how respondents make choices in discrete choice experiments (DCEs), and whether different strategies impact on the reliability of willingness-to-pay (WTP) results. Do individuals make choices with reference to their status quo (SQ) position, or can they make simulated market choices amongst only hypothetical scenarios? This study uses a split sample to test whether the inclusion or exclusion of the SQ on a choice card in DCEs affects the WTP estimates, based on visitors' preferences for tourist facilities at Kenyir Lake, Malaysia. The results indicated little difference between both the samples in terms of goodness-of-fit, size and significance of the attribute coefficients, and WTP estimates for the Conditional Logit (CL) and Mixed Logit (MXL) models.

Keywords: Status quo; discrete choice experiments; willingness-to-pay; conditional logit model; mixed logit model.

JEL Classification: Q51, C25

1. Introduction

There is a growing amount of literature in environmental economics concerning how respondents make choices in discrete choice experiments (DCEs), and whether different choice scenarios impact upon the reliability and accuracy of the results, and upon estimates of willingness-to-pay (WTP). The rational choice theory assumes preferences are complete and transitive. However, behavioral economics has revealed a number of anomalies such as anchoring effects, availability, framing, endowment effect, loss aversion, status quo (SQ)

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effect, and preference reversals. Reviews of these effects and other anomalies can be found in Thaler (1992), Thaler and Sunstein (2008), and Kahneman (2012). Such anomalies have cast some doubt on the rationality of preferences in all circumstances. One issue is whether individuals make choices with reference to the current situation or SQ position (Samuelson and Zeckhauser, 1988), or whether they can make rational choices amongst only hypothetical scenarios and whether such hypothetical choices will simulate actual market behavior.

Many environmental economists include the SQ position on a choice card (e.g., Adamowicz *et al.*, 1994; Hanley *et al.*, 1998; Scarpa *et al.*, 2007), in DCEs, as an alternative to one or more hypothetical constructs. The inclusion of the SQ alternative in a DCE study is believed to create an unforced situation with the goal of simulating actual market conditions and deriving unbiased welfare measures (e.g., Bateman *et al.*, 2002; Freeman *et al.*, 2014). Moreover, the research of Kahneman and Tversky (1979) suggests that individuals evaluate marginal gains and losses asymmetrically as values are defined with reference to the SQ. The inclusion of this SQ position is thus necessary to define and measure the asymmetric valuations of gains and losses from the SQ reference point.

However, there is debate in the literature regarding the necessity for offering the SQ alternative in a DCE question (e.g., Carson *et al.*, 1994; Johnson and Desvousges, 1997). In some cases, for example, the SQ may not be a realistic alternative, especially if the current situation is changing (Breffle and Rowe, 2002). Moreover, the inclusion of the SQ makes it easy for respondents to ignore the task of making trade-offs between attributes of the different hypothetical alternatives or scenarios, and simply opt for the SQ alternative as the easier choice. If respondents choose the SQ alternative too often in a DCE, this can lead to a lack of information on trade-offs between attributes. On the other hand, the exclusion of the SQ may lead to biased responses and WTP measures when respondents have to choose between hypothetical alternatives rather than being allowed to opt for the SQ position with no price increase. In this latter case, the exclusion of the SQ will not simulate actual market choices.

The purposes of this paper are to (1) investigate the impact of the SQ effect on consumer valuations of an unpriced product — open access recreation at a lake and subsequently provide methodological recommendation for future DCE studies and (2) inform the responsible authority on what attributes the visitors prefer to use at the recreational site. The study uses a split sample design in a DCE survey to examine the effect of including the SQ (along with two hypothetical scenarios) on each choice card, compared to choice cards with only two hypothetical scenarios. The results are reported in terms of descriptive statistics and respondents' opinions on the choice alternatives; the goodness-of-fit of the models; size and significance of the coefficients; and WTP values for each attribute. Conditional Logit (CL) and Mixed Logit (MXL) models were used in the analysis.

The main contribution of this paper is outlining the importance of offering and not offering the SQ option on the choice card, with the aim of providing more representative WTP estimates. This has implications for reducing choice complexity if one of the alternatives on the choice card can be omitted without any impact on the results. It assists in reducing choice complexity, since it shown that not including the SQ does not have a

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significant effect on the WTP results. Also, excluding the SQ will reduce the time taken to complete the questionnaire since respondents only have to evaluate two alternatives without the SQ option. In addition, the WTP estimates obtained from this paper are useful for policy management decisions for the development of tourist facilities in the future.

The remainder of the paper is organized as follows. Section 2 provides the literature review regarding the relevance of the SQ alternative in the DCEs application. Section 3 presents the theoretical background of DCEs. Section 4 explains the study design and the implementation of research. Section 5 discusses the results and finally, some conclusions are drawn in Section 6.

2. Literature Review

2.1. *Inclusion and exclusion of the SQ: Why is it important?*

The SQ or "do nothing" situation is an alternative describing the current scenario facing the respondent. Presenting the SQ on a choice card in a DCE is one way of ensuring an unforced choice alternative is available, where respondents can opt to reject all hypothetical alternatives and choose the current situation with no price increase. Thus, including the SQ option on each choice card allows current market demand to be assessed vis-a-vis possible changes to the specification of the good. Including the SQ position might be hypothesised as ensuring that more accurate and reliable welfare measures for the good are derived.

The inclusion of the SQ alternative is fairly standard in the application of DCEs, and is used in many studies (Hensher, 2010). Most importantly, the inclusion of the SQ option is a way to mimic real market transactions (Carson *et al.*, 1994) and to follow the Hicksian welfare measurement argument (Hanley *et al.*, 2001). The inclusion of the SQ alternative is supported on the basis that it makes the choice task more rational as an individual's experience will affect their choice decision. Thus, giving the opportunity to relate an individual's previous experience, with the experimental design alternatives presented, makes the stated choice tasks more realistic to assess (Ortúzar and Willumsen, 2011).

The inclusion of the SQ position may encourage some decision makers to stick with the SQ option (Samuelson and Zeckhauser, 1988) because of inertia or because it offers an "an easy way out" of a complex choice task. Thus, not presenting the SQ option on a choice card encourages decision makers to make trade-offs between the attributes in each hypothetical alternative scenario, and to choose the alternative that offers the greatest benefit. According to Krosnick *et al.* (2002), the quality of attitude reporting is not compromised by the omission of "no opinion" options; whilst the inclusion of a "no opinion" option in attitude measures may preclude measurement of some meaningful opinions.

The issue of whether to include the SQ is also linked to the issue of the Independence of Irrelevant Alternatives (IIA) problem in analyzing choice decisions since the SQ (or one of the hypothetical alternatives) might affect the choice made between the other two

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alternatives. IIA property[1] implies that logit models permit a certain pattern of substitution. In more detail, this property states that for an individual respondent, the ratio of the logit probabilities for any two alternatives, say, i and k, is:

$$\frac{Pni}{Pnk} = \frac{e^{v_{ni}} / \sum_j e^{Vnj}}{e^{v_{nk}} / \sum_j e^{Vnj}} = \frac{e^{v_{ni}}}{e^{v_{nk}}} = e^{v_{ni}} - e^{v_{nk}}$$

whereby this ratio is totally unaffected by the presence of other attributes from another alternative. In other words, the relative odds of choosing i over k is similar irrespective of the availability of any other alternatives or what the attributes of the other alternatives are (Train, 2003).

This violates the axiom of the IIA: the decision maker's preferences for an item should not change if the choice set is expanded. It suggests that the utility and value of an item depend on other options in the choice set. Comparative rather than absolute valuation is used in decision making.

The issue of whether to incorporate the SQ alternative in the DCEs question remains unsolved (Carson *et al.*, 1994; Banzhaf *et al.*, 2001). Many previous DCE studies typically chose to include the SQ as one of the alternatives in their choice sets (e.g., Adamowicz *et al.*, 1994; Hanley *et al.*, 1998; Scarpa *et al.*, 2007). However, some researchers have also excluded the SQ option (e.g., Boyle and Ozdemir, 2009; Carlsson *et al.*, 2007; Breffle and Rowe, 2002).

2.2. *Why individuals choose the SQ?*

Individuals may be motivated to choose the SQ alternative for various reasons. The SQ is chosen by the respondent when s/he has no preference for an increase in the quantity or quality of the good in question; values the proposed improvement less than the offer price; feels unwilling to pay for an improvement to the good in question or is unwilling to respond to the changes presented for a variety of reasons.

Using data from two choice experiments concerning forest biodiversity, Meyerhoff and Liebe (2009) found evidence that a protest attitude, an attitude toward the good, and perceived choice task complexity tended to influence the choice of the SQ alternative. However, only the attitude towards the good in question and the protest attitude showed significant effects across all econometric specifications.

Respondents might dispute the trade-off amongst attributes (Von Haefen *et al*., 2005), or choose the SQ to avoid making difficult decisions (Carson *et al.*, 1994). The selection of a

[1] To illustrate the IIA property, consider the famous red bus/blue bus example. A traveller has a choice of going to work by car or taking a blue bus. For simplicity, it is assumed that the representative utility for the both modes are the same, such that the choice probabilities are equivalent to one: $P_{\text{car}} = 1/2$; $P_{\text{bus}} = 1/2$; $P_{\text{car}} + P_{\text{bus}} = 1$. Now suppose that another bus service which is the red bus is introduced. The traveller considers the new bus service has equal attributes to the existing bus service, except that the buses are different in colours. For the logit model under the IIA property, the ratio of the choice probabilities is the same whether or not the red bus exists, and the ratio is equal to one. Hence, the new choice probabilities can be written as: $P_{\text{car}} = 1/3$; $P_{\text{redbus}} = 1/3$; $P_{\text{bluebus}} = 1/3$; $P_{\text{car}} + P_{\text{redbus}} + P_{\text{bluebus}} = 1$. In real life, this is unrealistic because the traveller will be most likely to treat the two bus modes as a single alternative and the choice probabilities represent this behavior can be written as follows: $P_{\text{car}} = 1/2$; $P_{\text{redbus}} = 1/4$; $P_{\text{bluebus}} = 1/4$; $P_{\text{car}} + P_{\text{redbus}} + P_{\text{bluebus}} = 1$. The ratio of choice probabilities for the car and the blue bus actually changes with the introduction of the red bus, instead of remaining constant as required.

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"no opinion" option has been found to be greatest amongst respondents with the lowest cognitive skills, as measured by educational attainment, and amongst respondents who devote little effort to the reporting process (Krosnick *et al.*, 2002).

Serial SQ choices were found by Lanz and Provins (2015) to be linked to those respondents who found the provision of information insufficient or the choice tasks too complex. Non-serial SQ choices did not necessarily reflect poor study design or a lack of understanding or care in responding to the DCEs questions. The analysis by Lanz and Provins (2015) showed that for many respondents the SQ is important because respondents were satisfied with current service levels or because respondents did not feel directly affected by the proposed changes in the provision of service attributes. Decisions to maintain the SQ tend to be regretted less than decisions to change. Mannetti *et al.* (2007) found people with a high need for cognitive closure tended to perceive the non-SQ choice as less normative, and therefore these people experienced more post-decision regret after non-SQ choices.

2.3. *The effect of the SQ*

The effect of the SQ in actual market demand cases was documented by Samuelson and Zeckhauser (1988). One example they cited was automobile insurance choice, where residents in New Jersey (NJ) and Pennsylvania were offered a choice between two types of insurance: a cheaper policy which restricted the right to sue and a more expensive version that did not. In NJ, where the cheaper policy was the default option, 83% chose this policy. Under Pennsylvania law, the default option was the expensive policy, and 53% of respondents opted for that policy. Since the socio-economic composition of the two states was similar, it should be expected that roughly the same proportion of residents would choose the cheaper and more expensive policies in both states, in the absence of any SQ inertia.

Hartman *et al.* (1991), sampled electricity consumers, where one group experienced on average three outages of approximately two hours duration per year, whilst the second group experienced on average 15 outages of 4 h duration per year. They found that both groups expressed a strong preference for their quite different SQ positions. Approximately 60% of respondents in each group preferred the SQ, with around 85% of respondents in each group preferring reliability regimes around the SQ, despite the fact that the reliability levels were quite different. Clearly, the SQ acts as a reference point which sets norms from which consumers judge changes.

Including the SQ alternative may not ensure a more realistic choice set, and it may not improve estimation (Breffle and Rowe, 2002). Public preferences for projects involving resource enhancement in and around the waters of Green Bay, Wisconsin, were evaluated by Breffle and Rowe (2002). Three types of choice card, which listed attributes and their levels in terms of two alternative choice options, were used. The first was two attribute options without monetary amounts; the second was a referendum format comprising an improvement option with a monetary attribute compared with the SQ option; and the third was a DCE with two alternative options including a monetary attribute. The smallest error

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variance occurred in the first variant, where there were only non-monetary attributes to trade-off between the two alternative options. The greatest variance in the error term occurred in the referendum format which included the SQ.

Excluding the SQ option should have no effect on a respondent's choice, if at least one of the alternatives presented on a DCE choice card is preferred to the SQ by the respondent (Boyle and Ozdemir, 2009). In such cases, the exclusion of the SQ should not affect econometric estimation and coefficient estimates for welfare evaluation. Boyle and Ozdemir (2009) found, in a study of farmland conservation, that the inclusion or exclusion of SQ alternatives did not affect the preference parameters and welfare estimates. However, they did observe that respondents were more likely to choose the SQ when there were three response options, and less likely to choose the SQ when there were only two options.

An opt-out option can be quite different from the SQ option. A study by Carlsson *et al.* (2007) examined consumers' preferences for animal husbandry and animal slaughter, for food processing in Sweden. The results revealed that the differences in marginal WTP for the random parameter logit models in CE were small between two survey versions: with and without the opt-out option. However, the opt-out option "I choose not to buy minced beef" was quite distinct from the other two options where minced beef was available. If most of the respondents were meat eaters, then the inclusion of such opt-out option might well have no significant effect on the marginal WTP if respondents chose one or other of the options where minced beef was available. Thus, suggesting that a biased choice does not occur as a consequence of excluding the opt-out option in the choice set may be misplaced if the opt-out option is quite different from the SQ option.

3. Theoretical Background of DCEs

Discrete choice modeling forms the theoretical foundation of the DCEs. This model has its foundation in classic economic consumer theory and it is based on two main theoretical extensions: the Theory of Value by Lancaster (1966) and Random Utility Theory (RUT) by Manski (1977). Researcher Lancaster (1966) proposed that the attributes of the goods determine the utility derived from the good. Thus, the utility can be expressed as a function of the attributes of the goods. However, according to Ben-Akiva and Lerman (1985), respondents in a DCE have been observed not to choose the same alternative in repetitions of similar choice situations. Consequently, a probabilistic choice mechanism, which is the RUT has been introduced to explain the behavioral inconsistencies of the respondents. The fundamental idea behind RUT is that the respondent, as a decision maker, is assumed to select the alternative that gives the highest utility to them.

In a discrete choice model, a respondent or decision maker n faces a choice amongst a set of alternatives J in the choice set. Each alternative gives a certain level of utility to the respondents. The utility is therefore decomposed into two components: (1) the deterministic or observable component V_{nj} which represents the part of the utility observed by the researcher, and (2) the difference between the true utility U_{nj} and the portion of the utility which is captured by the researcher in V_{nj}, which is called the random component or error

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term, denoted as ε_{nj}. Thus, both components can be written as:

$$U_{nj} = V_{nj} + \varepsilon_{nj}, \tag{1}$$

where:

U_{nj} is the true utility of alternative j for respondent n,
V_{nj} is the deterministic or observable component of the utility estimated by the researcher, and
ε_{nj} is the error term of the utility and is unknown to the researcher.

The model commonly used to estimate the DCE exercise is the Conditional Logit model. This model can be developed with the assumption that all of the error terms are independent and identically distributed (IID) in the choice set. Therefore, the probability of respondent n choosing alternative i can be expressed as:

$$P_{ni} = \frac{\exp(\mu V_{ni})}{\sum_j^i \exp(\mu V_{nj})}, \tag{2}$$

where μ is the scale parameter. The scale parameter cannot be identified in any single sample and hence is expected to be $\mu = 1$. By assuming that V_{ni} is linear in parameters, the functional form of the respondent systematic component of the utility function can be written as:

$$V_{ni} = \beta_1 X_{ni} + \beta_2 X_{2ni} + \beta_3 X_{3ni}, \ldots, B_k X_{kni}, \tag{3}$$

where X_s are the variables in the utility function and the β_s are the coefficients to be estimated. The standard approach to determining the value of β can be done through a maximum likelihood (ML) procedure as stated in equation (Hanley *et al.*, 2001):

$$\mathrm{LL} = \sum_{n=1}^{N} \sum_{j=1}^{J} y_{ni} \log P_{ni}, \tag{4}$$

where:

LL = Log likelihood function
y_{ni} = indicator variable defined as $y_{ni} = 1$ if respondent n chooses alternative i and zero otherwise.

Regardless of the widespread use of the CL model, there are limitations of this model concerning representing choice behavior. For example, the CL model can represent systematic taste variation that relates to observed characteristics of the respondent but not for a random taste variation. As a response to the weaknesses of the CL model, the MXL has been suggested as an alternative to the standard CL model.

The MXL formulation can be generated from the random coefficient specification which accommodates the unobserved taste heterogeneity of the respondents (Koppelman and Bhat, 2006. The random coefficients have a straightforward interpretation. The utility

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can be specified as:

$$U_{nj} = \beta'_n x_{nj} + \varepsilon_{nj}, \tag{5}$$

where x_{nj} is a vector of the observed variables that relate to alternatives j and the decision maker n, β_n is an unobserved vector of the coefficients for each n and represents the decision maker's tastes which vary in the population with density $f(\beta)$. This density is a function of parameter θ that denotes, for instance, the mean and covariance of the β in the population. Thus, the density can be denoted as $f(\beta_n \mid \theta)$. Meanwhile, ε_{nj} is an unobserved random term, assumed to be an IID extreme value, independent of β_n and x_{nj}. The aim is to estimate the population parameter (θ) which describes the distribution. The estimation of θ can be made based on different assumptions about its distribution. The distribution is specified to be normal in this study. In order to estimate β_n, the assumption that the tastes of the decision makers follow a particular distribution is made with density $f(\beta \mid \theta)$. Therefore, the unconditional choice probabilities are the integral of $L_{ni}(\beta_n)$ over all possible values of β_n, which represents the MXL probability:

$$P_{ni} = \int \left(\frac{e^{\beta' x_{ni}}}{\sum_j e^{\beta' x_{nj}}} \right) f(\beta) d\beta. \tag{6}$$

The estimation can be done by maximizing the log-likelihood function (Revelt and Train, 1998) as expressed below:

$$\mathrm{LL}(\theta) = \sum_n \ln P_{ni}(\theta). \tag{7}$$

Using the choice model data, the WTP value of the welfare measure can be estimated. This measure helps us to understand the impact of attribute changes to the economics and also the implications on the associated policy. The marginal WTP value is calculated by dividing the coefficient value of any attribute by the coefficient value of the cost attribute (Hoyos, 2010). The value indicates the amount of money that respondents are willing to pay in order to have the benefit of the attribute improvement (Bennett and Adamowicz, 2001). Thus, the WTP for a unit change in attribute i, for example, can be calculated as the negative of the ratio of i'sβ coefficient divided by the parameter of cost attribute β_{cost}.

$$\mathrm{WTP} = -\beta_i / \beta_{\text{cost}}, \tag{8}$$

where:

β_i = the coefficient of any of the attributes in the model
β_{cost} = the price coefficient.

4. Research Design and Implementation

The study reported here uses a sample of visitors to Kenyir Lake in Malaysia to investigate aspects of the ongoing debate concerning the SQ issue. The location of Kenyir Lake is shown in Figure 1. This man-made lake offers a wide range of recreational benefits to the visitors and it currently charges zero money for the entrance fee. Recreational activities

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Source: Malaxi (http://www.malaxi.com/terengganu/terengganu_map.html)

Figure 1. Map of Kenyir Lake

include swimming, angling, boating, canoeing, kayaking, rafting, water scooters, camping, walking and hiking. There are nature trails to many of the waterfalls, and the bordering tropical rainforest, part of the Taman Negara National Park, has crystal clear mountain streams and is home to thousands of species of animals and plants.

Gawi Jetty is the main access point for exploring Kenyir Lake. This jetty also provides several basic facilities for the visitors. However, the facilities are regarded as limited in their attractiveness to tourists. In addition, with only a small budget from the government, maintenance of the facilities provided is not carried out effectively or regularly, and this can impact on the quality of the facilities provided for the visitors. Thus, evaluating the

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preferences of the visitors with regard to the tourist facility attributes provided at Gawi Jetty can help this study to develop policy recommendations concerning the provision of such facilities in future.

Table 1 presents the attributes and levels used in this study, with their *a priori* expected signs. The identification of attributes and their levels were done based on two focus group studies of public opinion with respect to what are the important facilities that need to be provided at recreational areas, along with a rigorous literature review and an ongoing discussion with the policy maker who is responsible for providing the tourist facilities at the lake.

The attributes comprised of three attributes with two levels (jetty, car park and playground); two attributes with three levels (toilets and tourist information center); and one attribute with six levels (entrance fee). Based on the listed attributes levels, the D-efficient experimental design was used to generate the choice cards. This resulted in 72 hypothetical alternative scenarios, which were paired to produce 36 choice cards. Asking a respondent to answer all 36 choice cards would be cognitively too demanding for them.

Table 1. Attributes Used in the DCE

Attributes	Expected Sign	Level
Toilet	+	Level 1 — Basic: existing toilet facilities (10 toilets + 2 disabled toilets) Level 2 — Medium: improved toilet facilities (basic + bathrooms/shower rooms) Level 3 — Superior: further improved toilet facilities (medium + baby changing room)
Jetty	+	Level 1 — existing jetty Level 2 — an additional jetty: to reduce the crowding situation and increases convenience
Car Park	+	Level 1 — existing: 30 parking spaces Level 2 — larger: 100 parking spaces
Tourist Information Center (TIC)	+	Level 1 — Basic: existing information (brochures, pamphlets and information boards) Level 2 — Medium: improved tourist information center services (basic + video presentation) Level 3 — Superior: further improved tourist information center services (medium + tourist information officer)
Playground	+	Level 1 — existing basic playground Level 2 — enhanced playground: larger, safe and more stimulating
Entrance Fee	−	An increase in the entrance fee would have a negative impact on respondents' utility Entry fee per person in Ringgit Malaysian: RM 0 (existing free entry), RM 1, RM 2.50, RM 5, RM 7.50, RM 10

Notes: The words in *Italic* represent the status quo.

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Taking into consideration the complexity of a DCE question and to avoid tedium, the choice cards were blocked into six versions of six choice cards each.

The impact of including and omitting the SQ in a DCE study would typically be assessed by using a split sample design to examine the effect of an unforced and forced choice format on discrete choice responses. Split sample design has been used by Carlsson *et al.* (2007) and Dhar and Simonson (2003). The split sample design has two formats. The first format presents DCE questions in which the SQ option is included on each choice card, while the second design presents only two hypothetical choice situations without the SQ option. The split sample enables a comparison to be made of the results from the unforced (with the SQ alternative and no increase in entry charge) and forced choice situations (most of which had increases in entry charges) presented to the respondents. In total, there were 12 sets of forced and unforced questionnaires. Each respondent was randomly assigned one of these 12 sets and hence answered six choice cards. Figure 2 shows an example of a DCE choice card (unforced design) presented to the respondents.

This study employed an on-site survey. Interviews were conducted at the site in order to sample people who showed up at the jetty. Bateman *et al.* (2002, p. 91) argued that on-site surveys are appropriate in situation of the (1) uniqueness or substitutability of the good or service in question, (2) the need for familiarity of respondents with the good or service, (3) the scale of the change in question and (4) the context in which the valuation results will be used (related to the payment vehicle). This research adopted two of the factors suggested by Bateman *et al.* (2002), i.e., the familiarity of respondents with the good or

An example of a choice card is presented below. Two possible development options for the tourism facilities at Gawi Jetty are presented. If you would like to see an additional jetty, medium toilets and superior tourist information centre; but you are happy with the existing car parking slots and a small children's play area, and are willing to pay an entrance fee of RM 1 per person you should choose Option 1. If you would like to see a large children's play area, medium information center, an additional jetty, more car parking slots; but you are happy with the existing toilet conditions and are willing to pay an entrance fee of RM 7.50 per person, then you should choose Option 2. Alternatively, if you are happy with the current situation at Gawi Jetty or you do not want to pay an entrance fee then you should choose the Status Quo option.

Please tick √ which option you prefer.

Facilities	**Option 1**	**Option 2**	**Status Quo**
Toilet	Medium	Basic	Basic
Jetty	Two	Two	One
Car Park	30 slots	100 slots	30 slots
Tourist Information Centre	Superior	Medium	Basic
Children's Playground	Small	Large	Small
Entrance Fee	RM 1	RM 7.50	RM 0
Your Option			

Figure 2. The Example of DCE Choice Card for the Unforced Sample

service and the factor related to payment vehicle. This decision was made due to the fact that this study focuses on the satisfaction of visitors with the tourist facilities services at Gawi Jetty, as well as the effect of introducing the entrance fee system at Kenyir Lake. The visitors were sampled at Gawi Jetty. Once each interview was completed, the next person to pass by was interviewed. In other words, this study systematically samples the next person along to avoid any selection bias. In this way, it can be assumed that the sample can be representative of population under investigation.

Realizing that providing two different designs of DCE questions may cause bias in the responses, this study introduced a supplementary question at the end of the choice card to elicit the opinion of the respondents regarding the choice card design they answered. This included their opinion of the SQ alternative and the complexity of the choice cards in terms of the number of the attributes used. Figures 3 and 4 present these supplementary questions for the forced and unforced DCE questionnaire designs. It is worth noting here that all the reasons presented in both figures were based on the feedbacks received from two

Thinking about the choice cards, please indicate which of the following statements was the most applicable to your responses across the choice cards. Please tick (√) only one answer.

	Reason	Tick
1	It was easy to make a choice because there were only two alternatives.	
2	I tended to choose the option with the lowest price increase because there was no option to choose the current situation where there is no entrance fee.	
3	Choice was difficult because there were 6 attributes to consider.	
4	I felt forced to make a choice between Option 1 and Option 2 because I could not vote for "no change".	

Figure 3. Feedback Regarding the Forced Choice Card Design

Thinking about the choice cards, please indicate which of the following statements was the most applicable to your responses across the choice cards. Please tick (√) only one answer.

	Reason	Tick
1	It was difficult to make a choice because there were three alternatives.	
2	I chose the current situation because I do not want to pay an entrance fee.	
3	Choice was difficult because there were 6 attributes to consider.	
4	Choosing the current situation was easy and it meant I did not have to weigh up the benefits of the other two alternative options.	

Figure 4. Feedback Regarding the Unforced Choice Card Design

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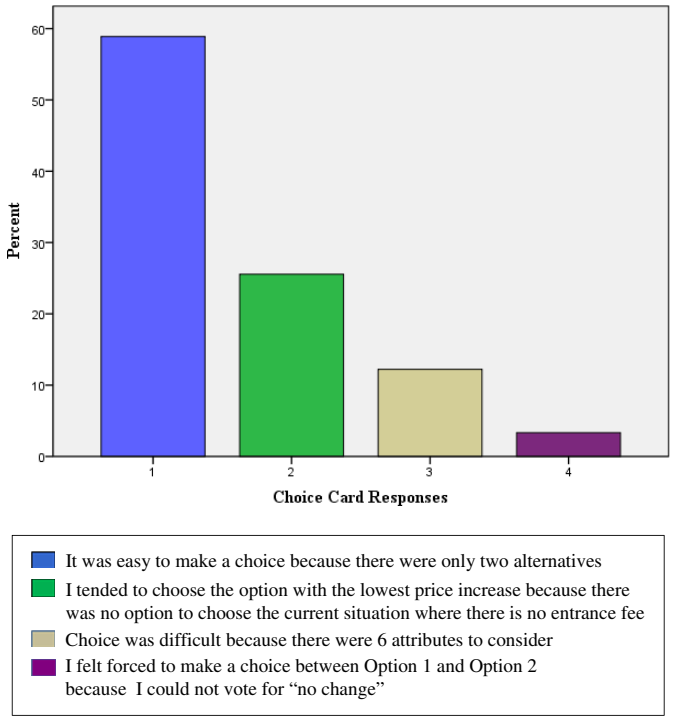

Figure 5. Choice Card Responses for the Forced Sample

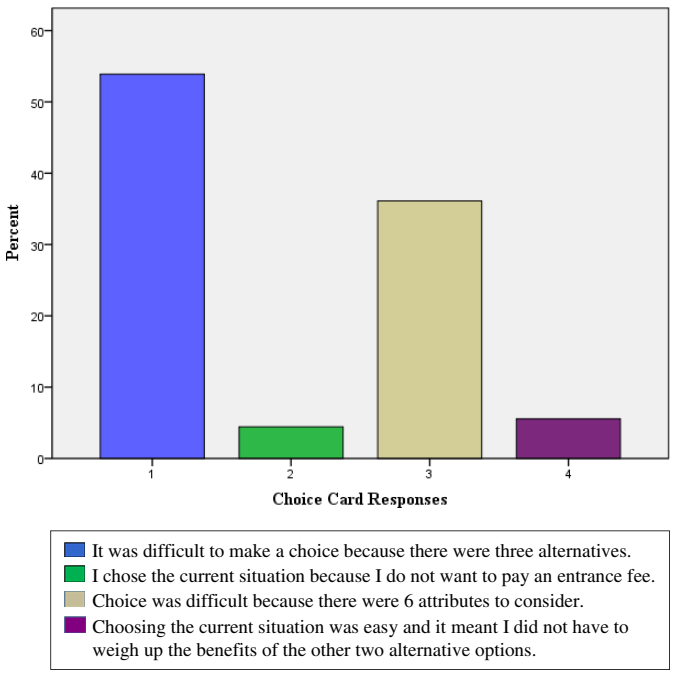

Figure 6. Choice Card Responses for the Unforced Sample

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focus group meetings and a pilot test. Figures 5 and 6 present a summary of the opinions of the respondents with regard to the choice card in both versions of the DCEs questionnaires.

5. Results and Discussion

5.1. *Descriptive statistical results*

The forced and unforced choice experiment samples both comprised 180 respondents. Table 3 shows that both samples had a similar socio-demographic profile of respondents. Both samples had similar age profiles, nationality of visitors, education, household size, occupation and income. So any difference in the results between the forced and unforced samples should not be attributable to different sample profiles. The hypothesis test for the difference between two proportions[2] was used to determine if the proportion of the respondents in the forced sample was significantly different to the proportions of the respondents in the unforced samples for several socio-demographic characteristics (e.g., gender, age group, occupation). The results revealed that the test statistics were less than z (1.96) at the 95% confidence level. In other words, there was no difference between both samples in terms of the characteristics of the respondents. Therefore, any results derived in the study could be deemed to show a difference attributable to the inclusion of the SQ, rather than being associated with the characteristics of the forced and unforced samples.

5.2. *Choice Card responses*

Figure 5 shows that more than half (58.89%) of the respondents in the forced sample stated that making a choice was easy as there were only two alternatives on the choice card. In the unforced model, Figure 6 shows that the majority of the respondents (53.89%) found making a decision more difficult because there were three alternatives to be considered.

In the forced sample, 25.56% of the respondents chose the lowest price increase option and only 3.33% felt forced to make a choice between two hypothetical options because they could not vote for "no change". Thus, there were a small percentage of the respondents in the forced sample who might choose the SQ alternative if it was offered on the choice card. This suggests that any bias due to presenting only a forced choice situation to respondents is small. In the unforced sample, only 4.44% said that they wanted the SQ alternative because they did not want to pay an entrance fee. Thus, only a small percentage of respondents in the unforced sample were influenced by the SQ alternative.

5.3. *The effect of the SQ alternative on the share of hypothetical alternatives*

The effect of having the SQ alternative on the preference between the forced and unforced DCE questions was explored in six different sets of choice sets. As shown in Table 3, the hypothetical options in all choice sets lost some share with the introduction of the SQ alternative, with the exception of Option 2 and Option 1 in choice set E and F. The share of

[2]his study refers to Drozdenko and Drake (2002) for the hypothesis test for the difference between two proportions.

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Table 2. Socio-Demographic Characteristics of the Forced and Unforced Samples

Demographic Variables		Forced Sample (%) ($n = 180$)	Unforced Sample (%) ($n = 180$)	Census[a] (%)
Gender	Male	55.0	61.7	51.0
	Female	45.0	38.3	49.0
Age Group	18–24 years old	21.1	14.4	21.2
	25–34 years old	36.1	40.6	25.8
	35–44 years old	26.7	28.3	19.6
	45–54 years old	12.2	10.6	15.8
	55 years old and above	3.9	6.1	17.6
Nationality	Local	98.9	98.3	—
	Foreign	1.1	1.7	—
Education	Primary school	3.9	3.4	—
	Secondary school	26.1	14.4	—
	Pre-University	6.1	10.6	—
	Diploma	28.9	37.2	—
	Undergraduate and Postgraduate	35.0	34.4	—
Household number	2 persons or fewer	6.6	4.4	—
	3–5 persons	57.1	66.2	—
	6–8 persons	30.6	28.8	—
	More than 8	5.7	0.6	—
Economic Variables				
Occupation	Professional and technician	18.9	18.3	—
	Administration and management	25.6	24.4	—
	Service industry	11.6	16.7	—
	Business	8.3	5.0	—
	Sales	20.0	21.7	—
	Student	10.6	3.9	—
	Housewife	3.3	7.8	—
	Retired	1.7	2.2	—
Monthly gross household income	Low (less than RM 2000)	13.3	10.5	—
	Medium (RM 2001–RM 4000)	71.1	68.9	—
	High (more than RM 4001)	15.6	20.6	—

[a]Department of Statistics Malaysia (2014).

the Option 2 and Option 1 in choice set E and F was slightly increased when the SQ alternative was available.

Generally, the comparison between the choice shares of the hypothetical options in the forced and unforced DCE choice cards revealed that the choice shares were not significantly different for both questionnaires. In total, the choice share of the SQ alternative was far lower (only 8.1%) compared to the Option 1 (52.3%) and Option 2 (39.5%). These findings revealed that the SQ alternative did not take away a great share

Table 3. The Effect of the Status Quo Alternative on the Relative Preferences for the Hypothetical Alternatives ($N = 180$ for Each Set)

Share of Option	Forced Choice	Unforced Choice
SET A		
Option 1	33.9 %	25.6%
Option 2	66.1%	63.9%
Status Quo		10.6%
SET B		
Option 1	68.3%	62.2%
Option 2	31.7%	31.1%
Status Quo		6.7%
SET C		
Option 1	54.4%	47.2%
Option 2	45.6%	42.8%
Status Quo		10.0%
SET D		
Option 1	67.2%	62.2%
Option 2	32.8%	32.2%
Status Quo		5.6%
SET E		
Option 1	73.9%	58.9%
Option 2	26.1%	28.9%
Status Quo		12.2%
SET F		
Option 1	50.6%	57.8%
Option 2	49.4%	38.3%
Status Quo		3.9%
Total		
Option 1	58.1%	52.3%
Option 2	41.9%	39.5%
Status Quo		8.1%

from the hypothetical alternatives which respondents tend to select under a forced choice. As stated by Dhar and Simonson (2003), the choice share of the SQ alternative was small in a situation where the choice set comprised an asymmetrically dominating alternative.

Thus, it would be expected that the utility associated with certain attributes in real profiles would tend to be unaffected in the presence of the SQ alternative. As a consequence, the WTP of the attribute would remain unchanged. This consequence is therefore investigated and presented in more detail in the next section using the logit family of DCE models.

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5.4. *DCE model results*

The DCE results are reported in Table 4 for the CL and MXL models.

Table 4 shows that the goodness-of-fit of the CL models for the forced and unforced samples were similar in terms of pseudo-R^2 values. The attributes had the right coefficient signs in both the forced and unforced samples, except for the TIC2 attribute where the coefficient was negative in both unforced models, with and without the inclusion of an Alternative Specific Constant (ASC)[3] for the SQ. However, in the unforced model without the inclusion of the ASC SQ, the coefficient for TIC2 was not statistically significant, and in the unforced model with ASC SQ, the TIC2 coefficient was only statistically significant at the 5% level.

The fact that the ASC SQ coefficient was found to be negative in the unforced CL model indicated *ceteris paribus* that the respondents had negative preferences for the SQ. The visitors to Kenyir Lake would prefer to see improvements to the facilities at Gawi Jetty. The coefficients in the unforced CL model were larger than compared to those in the forced CL model. The inclusion of an ASC SQ in the unforced CL model reduces the size of the coefficients compared to the coefficients in the unforced CL model when an ASC SQ was not included.

Based on Table 4, the goodness-of-fit of the MXL models was much better than those for the CL models, especially in the unforced sample. Again all the coefficients had the right sign, except for TIC2 which again was not statistically significant in the unforced model which did not include an ASC SQ. Meanwhile, the coefficient for TIC3 was not statistically significant in the MXL models for both the forced and unforced samples.

The MXL model indicated preference heterogeneity amongst visitors. Heterogeneity was less noticeable in the forced sample where the standard deviations on only two coefficients (jetty and car park) were statistically significant. In the unforced sample, heterogeneity in preferences for more attributes was noticeable in both MXL models with the inclusion or exclusion of the ASC SQ.

5.5. *Willingness-to-pay results*

The WTP for each attribute was calculated as the ratio of the attribute coefficient to the fee coefficient using the Wald procedure (Delta method). The CL estimates of WTP for improvement in each attribute level is presented in Table 5.

Based on Table 5, the CL forced model results showed that respondents expressed their highest WTP value of RM 7.577 for an improvement in toilet services to level 3, the level

[3] There are two main reasons for the inclusion of ASC's in the DCEs. Firstly, they are included when the alternatives are in the labeled format and not in the generic format. If the alternatives are in the generic format, then the ASC is assumed to be zero for that alternative since the utility differences between the alternatives is caused by the attributes which have already been integrated into the model (Kjaer, 2005). Secondly, the inclusion of ASCs is to explicitly account for the SQ effect in the DCEs analysis (Hensher *et al.*, 2015; Scarpa *et al.*, 2005), as applied in this study. Since the ASC represents the utility of selecting the SQ option, the negative ASC SQ coefficient indicates that choosing the SQ decreases utility. On the other hand, the positive ASC SQ coefficient indicates that respondents attach some positive utility to the SQ situation.

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Table 4. Coefficient Estimates for the CL and MXL Models

	CL						MXL					
			Unforced						Unforced			
	Forced		No ASC SQ		With ASC SQ		Forced		No SQ ASC		With SQ ASC	
Attribute	Coeff.	Prob $\|z\| > Z$	Coeff.	Prob $\|z\| > Z$	Coeff.	Prob $\|z\| > Z$	Coeff.	Prob $\|z\| > Z$	Coeff.	Prob $\|z\| > Z$	Coeff.	Prob $\|z\| > Z$
ASC SQ	—	—	—	—	−0.774	0.0001	—	—	—	—	−0.470	.1108
Toilet2	0.658	0.0000	1.059	0.0000	0.828	0.0000	0.714	0.0000	1.765	0.0000	1.572	0.0000
Toilet3	1.301	0.0000	1.749	0.0000	1.488	0.0000	1.449	0.0000	2.957	0.0000	2.712	0.0000
Jetty2	0.672	0.0000	1.216	0.0000	1.041	0.0000	0.767	0.0000	2.063	0.0000	1.896	0.0000
CarP100	0.840	0.0000	1.251	0.0000	1.108	0.0000	0.968	0.0000	2.150	0.0000	2.013	0.0000
TIC2	0.311	0.0046	−0.035	0.7525	−0.216	0.0750	0.384	0.0026	−0.065	0.7321	−0.198	0.3370
TIC3	0.076	0.4542	0.236	0.0292	0.111	0.3086	0.089	0.4444	0.153	0.4640	0.073	0.7257
PlayG2	0.168	0.0329	0.318	0.0003	0.202	0.0230	0.195	0.0314	0.615	0.0017	0.522	0.0075
Fee*	−0.172	0.0000	−0.252	0.0000	−0.252	0.0000	−0.201	0.0000	−0.421	0.0000	−0.446	0.0000
Standard Deviation												
ASC SQ							—	—	—	—	—	—
Toilet2							0.231	0.4288	1.139	0.0003	1.082	0.0005
Toilet3							0.047	0.9435	1.731	0.0000	1.678	0.0000
Jetty2							0.790	0.0000	1.416	0.0000	1.354	0.0000
CarP100							0.498	0.0088	1.643	0.0000	1.589	0.0000
TIC2							0.027	0.9322	0.651	0.0661	0.618	0.0726
TIC3							0.212	0.6282	1.557	0.0000	1.478	0.0000
PlayG2							0.001	0.9981	1.208	0.0000	1.151	0.0000
Pseudo-R^2	0.267		0.262		0.271		0.291		0.448		0.449	
N	1080		1080		1080		1080		1080		1080	

Notes: *denotes non-random coefficient. Each respondent answered 6 choice cards, thus, 180 respondents provided 1080 number of observations.

Table 5. Marginal WTP Estimates from CL Model for the Forced and Unforced Samples: Ringgit Malaysian (RM) 2016

	CL											
	Forced				Unforced							
					No ASC SQ				With ASC SQ			
Attributes	Coeff.	Prob $\|z\| > Z$	95% Confidence Limits		Coeff.	Prob $\|z\| > Z$	95% Confidence Limits		Coeff.	Prob $\|z\| > Z$	95% Confidence Limits	
Toilet2	3.831	0.0000	2.510	5.151	4.196	0.0000	3.235	5.157	3.285	0.0000	2.297	4.271
Toilet3	7.577	0.0000	5.873	9.281	6.930	0.0000	5.860	7.999	5.905	0.0000	4.808	7.001
Jetty2	3.912	0.0000	2.930	4.893	4.817	0.0000	4.099	5.535	4.133	0.0000	3.394	4.871
CarP100	4.893	0.0000	3.857	5.928	4.957	0.0000	4.258	5.655	4.397	0.0000	3.691	5.102
TIC2	1.810	0.0074	0.485	3.133	−0.140	0.7515	−1.010	0.729	−0.856	0.0691	−1.778	0.067
TIC3	0.444	0.4534	−0.716	1.603	0.938	0.0293	0.094	1.781	0.440	0.4317	−0.406	1.286
PlayG2	0.978	0.0328	0.080	1.875	1.259	0.0002	0.598	1.920	0.803	0.3464	0.123	1.481

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which had additional bathrooms and baby changing room facilities; followed by RM 4.893 for an increase in car parking slots from 30 to 100 parking slots; and RM 3.912 for the provision of an additional jetty.

In the CL unforced model with an ASC SQ variable, the respondents also expressed their highest WTP value (RM 5.905) for level 3 toilet services, followed by RM 4.397 for 100 parking slots and RM 4.133 for the provision of an additional jetty. With the exception of the WTP for the additional jetty, the unforced WTP values for each attribute level were lower than those in the forced sample. In both the forced and unforced with ASC SQ samples, the WTP values for TIC3 were not statistically significant. This result was perhaps not surprising since the descriptive statistics revealed that almost 68% of the respondents in both samples were repeat visitors. Thus, repeat visitors would be expected to be less likely to use (and pay for) the TIC, since they would already be familiar with the recreational facilities at Gawi Jetty.

Table 5 indicates that the WTP was lower across all attributes for the unforced sample in a model that included an ASC SQ, compared with a model that did not have an ASC SQ variable. Clearly, the ASC SQ variable was important in determining the WTP values. More importantly, Table 5 also revealed that the WTP values for improvements in the attribute levels were lower in the case of the unforced sample (with the ASC SQ variable) than in the case of the forced sample, with the exception of the WTP for the additional jetty. This general result suggested that the inclusion of the SQ alternative in a DCE choice card would result in lower WTP values for increases in attributes and attribute levels. Conversely, forcing respondents to choose between hypothetical alternatives, without the option of being able to select the SQ alternative (of no price increase) would result in higher WTP estimates.

However, although the estimated mean WTP values for the attributes derived from the survey which included the SQ as an alternative, and the DCE model which included an ASC for the SQ alternative were lower than the forced model, the confidence limits for the mean values were quite wide. The 95% confidence limits as presented in Table 5 showed that the mean WTP values for attributes from the forced choice survey, and the unforced choice survey with an ASC SQ, overlapped. Thus, there was no statistically significant difference between the mean WTP values for the forced and unforced choice survey formats.

The WTP estimates from the MXL models are reported in Table 6. The mean WTP value for each attribute was slightly lower in the MXL with an ASC SQ variable than in the model without this variable. In addition, except for Jetty2 and the children's enhanced play area PlayG2, the WTP values derived from the unforced ASC SQ sample were slightly lower than the WTP values estimated from the forced choice sample. However, in all the MXL models, the confidence limits for the mean values were quite wide. The 95% confidence limits showed the mean WTP values for attributes from the forced choice survey, and the unforced choice survey, overlapped. So, statistically there was no difference between the mean WTP values for the forced and unforced choice survey formats.

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Table 6. Marginal WTP Estimates from MXL Model for the Forced and Unforced Samples: Ringgit Malaysian (RM) 2016

	MXL											
					Unforced							
	Forced				No ASC SQ				With ASC SQ			
Attributes	Coeff.	Prob $\|z\| > Z$	95% Confidence Limits		Coeff.	Prob $\|z\| > Z$	95% Confidence Limits		Coeff.	Prob $\|z\| > Z$	95% Confidence Limits	
Toilet2	3.560	0.0000	2.267	4.853	3.904	0.0000	2.986	4.822	3.526	0.0000	2.525	4.528
Toilet3	7.231	0.0000	5.525	8.937	6.539	0.0000	5.399	7.680	6.087	0.0000	4.851	7.322
Jetty2	3.826	0.0000	2.707	4.946	4.562	0.0000	3.759	5.365	4.256	0.0000	3.391	4.871
CarP100	4.829	0.0000	3.768	5.890	4.754	0.0000	3.956	5.552	4.517	0.0000	3.691	5.120
TIC2	1.913	0.0031	0.643	3.183	−0.145	0.7313	−0.976	0.685	−0.444	0.3345	−1.347	0.458
TIC3	0.444	0.4422	−0.689	1.578	0.337	0.4636	−0.564	1.239	0.163	0.7255	−0.748	1.074
PlayG2	0.973	0.0294	0.080	0.097	1.360	0.0007	0.571	2.149	1.170	0.0044	0.363	1.976

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6. Conclusion

An important question in the design of DCE concerns the decision whether to include or exclude the SQ alternative in the choice card. Under certain conditions, it is possible that the forced choice DCE questions which exclude the SQ alternative might be more suitable to be applied than the unforced DCE choice questions which include this option. In particular, if respondents believe that procrastination is detrimental, or a choice must be made sooner or later, they might prefer not to have the SQ alternative (Dhar and Simonson, 2003). Briefly, the forced choice design that excludes the SQ alternative is found to be a better approach compared to the unforced choice design that includes this option, based on several important points of evidence revealed in our study.

This study is the first to introduce a supplementary question to compare the responses of the DCE choice cards and to determine if any bias in choice occurs as a result of presenting a split sample design of DCE questions to the respondents. The results of the choice card responses highlight some important findings. In the forced sample, the results showed that only a small percentage of the respondents (3.33%) felt forced to make a choice because they were not given an option to vote for no change (SQ). Meanwhile, some of the respondents (25.56%) tended to choose the lowest price option because of the unavailability of the SQ alternative on the choice cards. These findings suggest that some of the respondents in the forced sample would have a tendency to choose the SQ alternative if this option was available on the choice card.

If the respondents in a hypothetical WTP survey are being given a choice between two options but would actually prefer not to pick any and are not given an opportunity to express this preference within the SQ alternative, the possible consequence is that they would make a forced choice, which in truth would be a misrepresentation or falsification of their underlying utility function. In other words, the choices made by these respondents would be biased and would not present their true utility. The biased responses could lead to the researchers drawing an erroneous conclusion for use within economic valuation. However, only a small percentage of the respondents indicated that the choices made by them are driven by the absence of the SQ. Hence, this small bias response in the forced sample is not likely to significantly affect the overall results.

Meanwhile, in the unforced sample, more than half of the respondents claimed that it was difficult to make a choice with three alternatives. Choice difficulty denotes the complexity of the DCE question. As discussed in the literature, complexity often leads to a delay of choice, biased responses and adds noise to the choices (Beshears *et al.*, 2008). The complexity of the task induces response error, thus, decreasing the statistical accuracy of the econometric model (Regier *et al.*, 2014).

Therefore, the results from the choice card responses reveal that both forced and unforced DCE designs have a tendency to induce biased responses which could affect the accuracy of the result. Specifically, the biased response in the forced DCE questions is due to the unavailability of the SQ alternative on the choice card. Meanwhile, in the unforced sample, the biased response that might occur would be due to the difficulty of making a choice between the three alternatives presented on the choice card. Thus, it is obvious that

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both DCE designs have their own impact which needs to be carefully considered by the researchers. For this case study, the results revealed that the biased responses were likely to be higher in the unforced sample due to the choice difficulty compared to the forced sample. Thus, the forced DCE design, which excludes the SQ alternative, is considered to be better compared to the unforced DCE design, since the bias response is minimal in the forced design.

The empirical work carried out in this paper also supports the justification as to why the forced choice design is better in comparison to the unforced choice design in the case study. When given the option to remain with the current situation (SQ), only a very small amount of respondents (8.1%) in the unforced sample chose to do so. This has led to the choice shares of the two hypothetical options (Table 3) in the forced and unforced samples being insignificantly different. The results also signify that the respondents are keen to respond to the changes presented. Thus, it seems irrelevant to offer the SQ alternative when in reality, the respondents want a change from the current situation.

The choice responses from the split sample design of the DCE questionnaires were further analyzed by using the logit family of the DCE. The analysis began with the simple CL model. The basic finding across the three simple CL models in both the forced and unforced samples was that the model fit and WTP estimates were not significantly different. In order to explore the presence of unobserved taste heterogeneity, the MXL model was specified for both samples. The goodness-of-fit of the MXL models were better compared to the CL models, especially in the unforced samples (with and without the ASC SQ).

The significant standard deviation estimates in the MXL models showed the presence of unobserved taste heterogeneity. In the simple MXL model, particularly in the forced sample, heterogeneity was less noticeable where the standard deviations on only two parameters (Jetty2 and CarP100) were statistically significant. Meanwhile, in the unforced sample, heterogeneity in the preferences for more attributes was noticeable in both the simple MXL models, with and without the specification of the ASC SQ. These results indicated that the degree of heterogeneity was found to depend on the choice card design (with and without the SQ alternative).

Similar to that achieved in the CL models, the WTP estimates in the MXL models for both the forced and unforced choice survey formats were not significantly different. Thus, the results of the MXL models suggest that there were no significant differences in the welfare estimates between the survey versions with and without the SQ alternative, except that the version including the SQ alternative revealed greater unobserved heterogeneity, similar to the findings of Carlsson *et al.* (2007). This indicates that including the SQ alternative increases the variance but does not have an effect on welfare estimates.

The adoption of the forced choice questions in DCE is likely to provide somewhat higher but not substantially different WTP values than the unforced choice questions. In this respect, this study supports the results of Carlsson *et al.* (2007) who noted only small differences in WTP between forced and unforced respondent samples.

Based on the WTP estimates, the results of the CL and MXL models indicated that the respondents in the forced and unforced samples were willing to pay higher for Toilet3,

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Jetty2 and CarP100 compared to the other attributes levels. Generally, the same rank order of WTP values for the attributes holds across the forced and unforced samples, and across the CL and MXL models.

The findings reported in this paper highlight several important considerations related to the application of the CE method in the future. Firstly, it should be noted that DCE studies based on both forced and unforced questions have different consequences and limitations, and the researchers must choose the design that is best suited for each case study or possibly employ both methods. Therefore, to determine which method is best for a particular case study, it is important to undertake a more significant pilot study in order to uncover several things, for example, to examine whether the respondents preferred the SQ alternative compared to the other options. In other words, it is worth assessing the trade-off between applying a forced DCE choice card or an unforced DCE choice card at the start of the research, so that the consequences of taking the forced or unforced approaches can be carefully considered. Thus, whether the SQ is relevant or not as one of the alternatives in the DCE choice set can be empirically determined through the pilot test before deciding whether to include it or not in the main survey.

Secondly, if the forced choice is going to be used in the main survey, it is still important for a future study to investigate the bias responses that might occur due to the absence of the SQ alternative in the choice card. This is so these bias responses can be excluded from the analysis to produce a more representative estimate. Thus, providing a supplementary question regarding the responses of the choice card seems to be crucial in order to detect the bias responses due to the absence of the SQ alternative in the forced DCE design.

The WTP estimates derived from the CL and MXL models were further examined in order to derive policy recommendations for improvements to the tourist facilities attributes. The basic finding across the two samples of respondents (forced and unforced) was that with the proposed entrance fees ranging from RM 1 to RM 10, the respondents expressed positive WTP values for most of the attributes presented in the study. Thus, the results indicate that the respondents accept the proposed entrance fee and they realize the benefit that they will get from the implementation of an entrance fee system. With the increase in the number of visitors every year, the responsible authority should consider imposing an entrance fee or other charges for future visitors at Kenyir Lake as a viable way of increasing revenues to cover the development and maintenance of the tourist facilities. Also, based on the WTP estimates, the results of the CL and MXL models indicated that the respondents in the forced and unforced samples were willing to pay higher for Toilet3, Jetty2 and CarP100 compared to the other attributes levels. This information could be used by the responsible policy maker to improve the current facilities provided at the jetty.

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